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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HADDAD, MAHER M	

ART UNIT	PAPER NUMBER
1644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,817	MANKELOW ET AL.	
	Examiner	Art Unit	
	Maher M. Haddad	1644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-28 and 30-43* is/are pending in the application.

4a) Of the above claim(s) *30-37 and 39-43* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-28 and 38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/7/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 07, 2008 has been entered.

2. Claims 26-28 and 30-43 are pending.

3. Claims 30-37 and 39-43 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected inventions. Newly added claims 39-41 are drawn to non-elected species and claims 42-43 are drawn to non-elected Group.

Regarding the rejoinder of the species, Applicant is reminded that upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

Regarding the rejoinder of the methods claims, applicant is reminded that where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder.

4. Claims 26-38 and 38 are under examination as they read on an antagonist of a ligand for an epitope or footprint domain for binding integrins comprising a domain of ICAM-4 and the species of SEQ ID NO: 9

5. Applicant's IDS, filed 11/7/08, is acknowledged.

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 26-28 and 38 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not provide adequate written description of the claimed invention. The legal standard for sufficiency of a patent's (or a specification's) written description is whether that description "reasonably conveys to the artisan that the inventor had possession at that time of the...claimed subject matter", Vas-Cath, Inc. V. Mahurkar, 19 U.S.P.Q.2d 1111 (Fed. Cir. 1991). In the instant case, the specification does not convey to the artisan that the applicant had possession at the time of invention of the claimed antagonist.

The claims recite an antagonist of a ligand for binding integrins in which said antagonist consists essentially of amino acid residues selected from the group consisting of 3-9 amino acid residues of strand A/G, SEQ ID NO: 2/3, of domain 1 of ICAM-4, SEQ ID NO: 1. The only antagonist of a ligand for binding integrins specifically disclosed in the specification are SEQ ID NO: 9-11 (each consist of 9 residues). The antagonists encompasses a vast array of molecules which can function as a ligand for binding any integrins wherein said antagonist are not disclosed in the specification or known in the prior art (such as three, four five six seven eight or nine, etc.) of strand A/G and wherein the structure of said antagonist is unpredictable. The claims encompass antagonists which bind any mammalian any integrins. The specification does not disclose any 3, 4, 5, 6, 7, 8, 9 amino acid residues of strand A/G (SEQ ID NO:2/3) of domain 1 of ICAM-4 (SEQ ID NO: 1), that acts as antagonist of a ligand for binding integrins. Besides SEQ ID NOS: 9-11, the specification dose not disclose which " three, four, five, six, seven, eight, or nine amino acids of strand A/G of domain 1 of ICAM-4" responsible for integrins binding. Thus, the written description provided in the specification is not commensurate with the scope of the claimed inventions. In view of the aforementioned problems regarding description of the claimed invention, the specification does not provide an adequate written description of the invention claimed herein. See The Regents of the University of California v. Eli Lilly and Company, 43 USPQ2d 1398, 1404-7 (Fed. Cir. 1997). In University of California v. Eli Lilly and Co., 39 U.S.P.Q.2d 1225 (Fed. Cir. 1995) the inventors claimed a genus of DNA species encoding insulin in different vertebrates or mammals, but had only described a single species of cDNA which encoded rat insulin. The court held that only the nucleic acids species described in the specification (i.e. nucleic acids encoding rat insulin) met the description requirement and that the inventors were not entitled to a claim encompassing a genus of nucleic acids encoding insulin from other vertebrates, mammals or humans, id. at 1240. The Federal Circuit has held that if an inventor is "unable to envision the detailed constitution of a gene so as to distinguish it from other materials. Conception has not been achieved until reduction to practice has occurred", Amgen, Inc. v. Chugai Pharmaceutical Co, Ltd., 18 U.S.P.Q.2d 1016 (Fed. Cir. 1991). Attention is also directed to the decision of The Regents of the University of California v. Eli Lilly and Company (CAFC, July 1997) wherein is stated: The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See In re Wilder, 736 F.2d 1516, 222 USPQ 369, 372-373 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outlin[e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate."). Accordingly, naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material.
Thus, as we have previously held, a cDNA is not defined or described by the mere name "cDNA," even if accompanied by the name of the protein that it encodes, but requires a kind of

specificity usually achieved by means of the recitation of the sequence of nucleotides that make up the cDNA. See Fiers, 984 F.2d at 1171, 25 USPQ2d at 1606.

Applicant's arguments, filed 11/7/08, have been fully considered, but have not been found convincing.

Applicant submits that Examples are included in the specification that enable one skilled in the art obtain the claimed antagonists. In fact, based on the instant disclosure, screening would be practiced by the skilled person in order to obtain the claimed antagonists. As explained above, the skilled person is provided with a screening approach by applicants' specification. In similar circumstances, the Federal Circuit has considered applications enabling where screening was required. See In re Wands, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988) (holding an application enabled where there was "considerable direction and guidance" in the specification, "a high level of skill in the art," and the "methods needed to practice the invention were well known."); MPEP § 2164.01(a) (Rev. 6, September 2007). These factors inure to applicants' benefit regarding the screening aspects of the present invention.

Applicants also refer that screening of mutants and constructs is expected in biotechnology, and therefore it cannot amount to undue experimentation. Rather, screening is a routine task that is considered part of the normal practice in this field. See Falkner v. Inglis, 448 F.3d 1357, 1365 (Fed. Cir. 2006); In re Wands, 858 F.2d 731,740 Fed. Cir. 1988); Hybritech Inc. v. MonoclonalAntibodies, Inc., 802 F.2d 1367, 1384 (Fed. Cir. 1986); Exparte Mark, 12 USPQ2d 1904, 1907 (Bd. Pat. App. Int. 1989).

Applicants further refer that antagonist residues and other, less identical, sequences can be made in view of the teachings of Examples 1-3 of the specification (see for example, pages 16-23 and pages 23-27 for sequences and amino acid residues), disclosures of Figures 1-20 and the description on pages 8-16). Thus, such less identical sequences need not be disclosed in a specification. See Falkner v. Inglis, 448 F.3d 1357, 1365 (Fed. Cir. 2006). Moreover, the immunogenicity of such less identical sequences can be readily screened in view of the instant specification, and such screening is an expected part of the practice of biotechnology. See In re Wands, 858 F.2d 731,740 Fed. Cir. 1988); Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1384 (Fed. Cir. 1986)

However, while one skilled in the art would have been able to make and use the full scope of claims 26 through routine experimentation, Applicants did not describe the invention of claim 26 sufficiently to show they had possession of the claimed genus of antagonists. Claim 26 is a genus of antagonist of a ligand for binding integrins. Sufficient description to show possession of such a genus "may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus." Eli Lilly, 119 F.3d at 1568, 43 USPQ2d at 1406. Possession may not be shown by merely describing how to obtain possession of members of the claimed genus or how to identify their common structural features. See University of Rochester, 358 F.3d at 927, 69 USPQ2d at 1895. Applicants have not described which 3 to 9 residues of strand A/G of domain 1 of ICAM-4 are correlated wit the required binding to integrins, and thus have not described which of the 3-9 residues can be use as antagonist of a ligand for binding integrins. Without a correlation between structure and function, the claim does little more than define the claimed invention by function. That is not sufficient to satisfy the written description requirement. See Eli Lilly, 119 F.3d at 1568, 43 USPQ2d at 1406 ("definition by function… does nto suffice to define the genus because it is only an indication of what the gene does, rather than what it is").

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 26 stands rejected under 35 U.S.C. 102(b) as being anticipated by Hermand et al (IDS ref. No. A03).

Hermand et al teach an antagonist of a ligand for binding integrins in which said antagonist consists essentially of ^{20}VRMSPEFVAV^{29} of strand A (claimed SEQ ID NO:2) of domain 1 of ICAM-4. Hermand et al further teach an antagonist of a ligand for binding integrins in which said antagonist consists essentially of ^{90}KTRWATSRITA^{100} of strand G (claimed SEQ ID NO: 3) of domain 1 of ICAM-4 (see Fig. 1). For examination purposes, the phrase "consists essentially of" is being interpreted as being inclusive or open-ended which does not exclude additional unrecited elements, provided that the additional elements "do not materially affect the basic and novel characteristic(s)" of the claimed invention.
Thus, the team "consists essentially of" would open up the sequence to include the extra residue(s) in the sequence without affecting its binding to integrins in the absence of evidence to the contrary.

The reference teachings anticipate the claimed invention.

Applicant's arguments, filed 11/7/08, have been fully considered, but have not been found convincing.

Applicant submits that Hermand et al does not disclose an antagonist consisting essentially of 3-9 residues of the A/G strand of ICAM-4.

It is the Examiner's position that Hermand et al do teach an antagonist *consisting essentially of* 3-9 residues of A/G strand of ICAM-4. "Consisting essentially of" would open up the claimed amino acid residues to include the extra residue(s). Accordingly, Hermand et al anticipate the claimed invention.

Applicant submits that Hermand et al discloses a full-length ICAM-4 for example, a 10 amino acid sequence which is included within in that large protein is indicated by the first arrow of figure 1. Applicant argues that this is not a disclosure of an antagonist consisting essentially of the recited number of amino acids. In addition, the amino acid sequence indicated by this arrow does not include an FWV motif. The paragraph "Reagents and antibodies" on page 26003 of Hermand et al refers to an antibody raised against the N-terminal 15 amino acids of ICAM-4.

However, Figure 1A is not the full-length ICAM-4 it is only residues 20-202 of human ICAM-4. Moreover, Figure 1 delineates each strand in Fig. 1 as indicated by the "↔". Strand A is ^{20}VRMSPEFVAV^{29} and stand G is ^{90}KTRWATSRITA^{100}. It is the Examiner's position that once

the strands are traced and outlined in the 182 amino acids long sequence, it is no longer can be said that the strands are included within a large protein.

Applicant submits that there is no disclosure at all in Hermand et al of small fragments of ICAM-4 being functional as antagonists to a ligand for ICAM-4. Applicant submits that Hermand et al provides a disclosure of the full length sequence of ICAM-4 and an analysis of its structure, setting out the various immunoglobulin folds included in that structure. The skilled person is provided with no teaching or suggestion that isolation of smaller fragments of this sequence would provide an antagonist to a ligand for this sequence. Accordingly, Hermand et al. cannot anticipate the claimed invention.

It is the Examiner's position that Hermand et al delineates, traces and outlines all the strands of domains 1 and 2 of the ICAM-4 including the claimed A and G strands of the ICAM-4. The functional properties are inherent properties. The term "consisting essentially of" would open up the claimed amino acid residues to include the extra amino acid residue(s).

10. Claims 26-28 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Bailly et al (IDS Ref No. A01) as is evidenced by the provisional Applicant No. 60/423,391 at page 1.

Bailly et al teach an antagonist consists of a peptide (AQSPKGSPLASG(G)SV**PFXVRM(S)**(P)) having the amino acid sequence as defined in SEQ ID NO: 9 (SVPFWVRMS) as claimed in claim 28, wherein X is undetermined amino acid, in which said peptide defined by ICAM-4 strand A includes amino acid residues F18, W19 and V20 of ICAM-4 s claimed in claim 27 (see table 1). X being W is inherent property of the N-terminal peptide sequence of ICAM-4, as is evidenced by provisional Application No. 60/423,391 at page 1, that the amino acid X at position 18 is W in the mature human ICAM-4 sequence. Further, Bailly et al teach the peptide WATS(R) (see table 1) which consist of 5 amino acid residues. WATSR is located at amino acid position 93-97 of ICAM-4 (G strand). The claimed functional activity is inherent property of the referenced peptide.

While the prior art teachings may be silent as to the "antagonist of a ligand for binding integrins" in claim 26, wherein "integrin is an αv integrin" in claim 38 per se; the product in the reference are the same as the claimed product. Therefore the claimed functional activity is considered inherent properties.

The reference teachings anticipate the claimed invention.

Applicant's arguments, filed 11/7/08, have been fully considered, but have not been found convincing.

Applicants submit that in relation to Bailly et al., Table 1 sets out sequences identified using tryptic digestion, presumably of the full length protein. The examiner perhaps takes this disclosure of the sequence of a small fragment of ICAM-4 as an incentive to the skilled person to attempt to isolate such fragments for use as antagonists of a ligand to ICAM-4. It should be noted, however, that Bailly et al represents early (1994) work in the procedure of elucidating the sequence and structure of ICAM-4. The use of tryptic digestion is a means of providing small fragments of a protein, which may then be fully sequenced, the information from each fragment being combined to provide information of the sequence of the whole protein. There is even no suggestion in this disclosure that these short peptides would bind to a ligand of ICAM-4. Accordingly, Bailly et al. can not anticipate the claimed invention.

While Applicants do not dispute that Bailly et al teachings of the sequences set out in Table 1 (i.e., fragments), however, applicant contends that these fragments were generated using tryptic disgestion. However, a peptide is a peptide irrespective of how it is made. The patentability of a product does not depend on its method of production. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985), MPEP 2113. With respect to binding to a ligand of ICAM-4, it is noted that a peptide is a peptide irrespective of its intended use.

11. Claim 26 stands rejected under 35 U.S.C. 102(e) as being anticipated by WO2003025125-A2.

The `125 publication teaches the tripeptide ITA of strand G of domain 1 of ICAM-4. The claimed functional activity is inherent property to the reference tripeptide (see page 67, published SEQ ID NO: 48 in particular).

```
Qy          9 ITA 11
              |||
Db          1 ITA 3
```

The reference teachings anticipate the claimed invention.

12. Claim 26 stands rejected under 35 U.S.C. 102(b) as being anticipated by WO200220723-A2.

The `723 publication teaches a tripeptide VRM of strand A of domain 1 of ICAM-4. The claimed functional activity is inherent property to the reference tripeptide (see page 78, published SEQ ID NO: 313 in particular).

```
Qy          4 VRM 6
              |||
Db          1 VRM 3
```

The reference teachings anticipate the claimed invention.

13. No claim is allowed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maher Haddad whose telephone number is (571) 272-0845. The examiner can normally be reached Monday through Friday from 7:30 am to 4:00 pm. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eileen B. O'Hara can be reached on (571) 272-0878. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 3, 2009

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